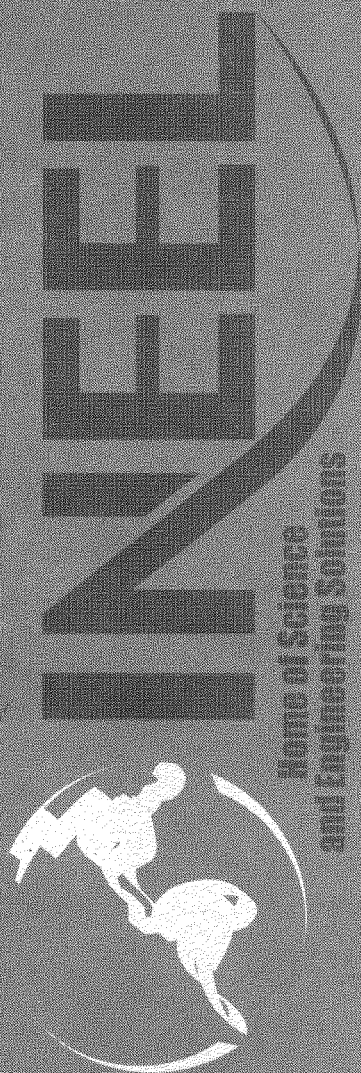


Field Sampling Plan for the OU 7-10 Glovebox Excavator Method Project

*Hopi Salomon
Daryl R. Haefner
Beth A. McIlwain
Jila Banaee
Jeffrey J. Einerson
Anna K. Podgorney*

January 2003



*Idaho National Engineering and Environmental Laboratory
Bechtel BWXT Idaho, LLC*

Field Sampling Plan for the OU 7-10 Glovebox Excavator Method Project

**Hopi Salomon*
Daryl R. Haefner
Beth A. McIlwain
Jila Banaee
Jeffrey J. Einerson
Anna K. Podgorney**

January 2003

**Idaho National Engineering and Environmental Laboratory
Environmental Restoration Program
Idaho Falls, Idaho 83415**

**Prepared under Contract No. 00007724
for the
U.S. Department of Energy
Assistant Secretary for Environmental Management
Under DOE Idaho Operations Office
Contract DE-AC07-99ID13727**

Field Sampling Plan for the OU 7-10 Glovebox Excavator Method Project

INEEL/EXT-02-00542
Revision 0

Approved



Steven A. Davies, Bechtel BWXT Idaho, LLC
OU 7-10 Glovebox Excavator Method Project
Project Engineer

1/28/03
Date



David E. Wilkins, Bechtel BWXT Idaho, LLC
OU 7-10 Glovebox Excavator Method Project
Deputy Project Manager

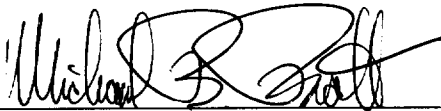
1/28/03
Date



Thomas M. Dicken, Bechtel BWXT Idaho, LLC
OU 7-10 Glovebox Excavator Method Project
Operations Manager

1-29-03

Date



Michael B. Pratt, Bechtel BWXT Idaho, LLC
OU 7-10 Glovebox Excavator Method Project
Project Manager

1/28/03
Date

ABSTRACT

The OU 7-10 Glovebox Excavator Method Project was approved by the U.S. Department of Energy to demonstrate retrieval of 75 to 125 yd³ of buried transuranic waste and contaminated soil from Operable Unit 7-10 at the Subsurface Disposal Area within the Radioactive Waste Management Complex of the Idaho National Engineering and Environmental Laboratory; to provide information on contaminants present in the underburden; and to characterize and package waste zone material for safe and compliant storage pending a decision on final disposition. This field sampling plan describes how and where samples will be collected to characterize waste zone material and underburden soils in support of the project.

CONTENTS

ABSTRACT.....	iii
ACRONYMS.....	ix
1. INTRODUCTION AND SITE BACKGROUND.....	1
1.1 Objectives of the Project.....	1
1.2 Scope of the Field Sampling Plan	1
1.3 Site Background.....	2
1.3.1 Site History	2
1.3.2 Existing Information and Contaminants of Interest	5
1.4 Report Organization	8
2. SAMPLING AND DATA QUALITY OBJECTIVES.....	9
2.1 Soils and Waste Solids	10
2.1.1 Problem.....	10
2.1.2 Decisions	10
2.1.3 Decision Inputs	10
2.1.4 Boundaries	13
2.1.5 Decision Rules	13
2.1.6 Sampling Design and Associated Decision Error	13
2.2 Subpopulations of Soils and Waste Solids.....	13
2.2.1 Problem.....	13
2.2.2 Decisions	14
2.2.3 Decision Inputs	14
2.2.4 Boundaries	14
2.2.5 Decision Rules	15
2.2.6 Sampling Design and Associated Decision Error	15
2.3 Quality Assurance Objectives for Measurement.....	15
2.3.1 Precision	15
2.3.2 Accuracy.....	16
2.3.3 Representativeness	16
2.3.4 Detection Limits.....	16
2.3.5 Completeness	16
2.3.6 Comparability	17
2.4 Data Validation	17

3.	SAMPLE LOCATION AND FREQUENCY	18
3.1	Overview of Waste Retrieval Process	18
3.2	Waste Zone Material Sampling.....	19
3.2.1	Sampling Soils and Waste Solids.....	20
3.2.2	Sampling Soils and Waste Solids Potentially Containing Nitrate-Bearing Waste	25
3.2.3	Sampling Uncontainerized Liquids Potentially Containing Polychlorinated Biphenyls	25
3.2.4	Sampling Pellets Potentially Containing Cyanide.....	26
3.2.5	Sampling Organic Sludge to Support Requests from the Operable Unit 7-13/14 Project	26
3.2.6	Special-Case Waste, Outlier Waste, or Unplanned Sample Collection Opportunities.....	26
3.2.7	Sampling Interstitial Soil for the Agencies	26
3.3	Underburden Core Sampling	27
3.3.1	Core Locations	27
3.3.2	Locating Cores	29
3.3.3	Thickness of Core Samples and Further Sectioning of Core	32
4.	SAMPLE DESIGNATION.....	34
4.1	Sample Identification Code.....	34
4.2	Sampling and Analysis Plan Table and Database	35
4.2.1	General	35
4.2.2	Sample Description Fields	35
4.2.3	Sample Location Fields	36
4.2.4	Analysis Types.....	36
5.	SAMPLING EQUIPMENT AND PROCEDURES	37
5.1	Quality Assurance and Quality Control Samples.....	37
5.1.1	Duplicates	37
5.1.2	Duplicates of Core Samples.....	38
5.1.3	Duplicates of Waste Zone Materials	38
5.1.4	Field Blanks	38
5.1.5	Equipment Rinsate Blanks.....	38
5.1.6	Trip Blanks	38
5.2	Visual Examination	38
5.3	Sampling Waste Zone Materials	39
5.3.1	Collection of Samples from Soils and Waste Solids	39

5.3.2	Collection of Samples from Materials Potentially Containing Nitrate-Bearing Waste	40
5.3.3	Collecting Samples of Uncontainerized Liquids for Polychlorinated Biphenyls Analysis	40
5.3.4	Collecting Samples of Pellets Potentially Containing Cyanide	40
5.3.5	Collecting Samples of Organic Sludge to Support Requests by Operable Unit 7-13/14	40
5.3.6	Collecting Samples of Interstitial Soil for Turnover to the Agencies	41
5.4	Underburden Core Sampling	41
6.	SAMPLE HANDLING AND ANALYSIS	42
6.1	Documentation	42
6.1.1	Sample Container Labels	42
6.1.2	Logbooks	42
6.1.3	Data Management	42
6.2	Sample Handling	42
6.2.1	Sample Preservation	42
6.2.2	Sample Custody	42
6.2.3	Sample Transportation	43
7.	WASTE MANAGEMENT	44
7.1	Waste Types and Disposition Logic	44
7.2	Waste Determinations	45
7.3	Pollution Prevention and Waste Minimization	46
8.	REFERENCES	48
Appendix A—Examples of Typical Sampling and Analysis Plan Tables for the OU 7-10 Glovebox Excavator Method Project		A-1

FIGURES

1.	Location of the Radioactive Waste Management Complex within the Idaho National Engineering and Environmental Laboratory	3
2.	Diagram of the Radioactive Waste Management Complex with an expanded view of the OU 7-10 Glovebox Excavator Method Project area	4
3.	Diagram of the OU 7-10 area and the project site (fan-shaped area)	4

4.	Facility layout of the OU 7-10 Glovebox Excavator Method Project	18
5.	Weather Enclosure Structure housing the Retrieval Confinement Structure and the glovebox operations.....	19
6.	Depiction of sampling approach used for soils and waste solids	21
7.	Logic diagram used to obtain interstitial soil samples from the waste zone for the U.S. Environmental Protection Agency.....	28
8.	Proposed core locations for excavation bottom using r, θ d positioning system	30
9.	A systematic 10-character sample identification code will be used to uniquely identify samples	34

TABLES

1.	Waste content in the OU 7-10 Stage I and II and project retrieval areas.....	7
2.	Data quality objectives for OU 7-10 Glovebox Excavator Method Project	11
3.	Sample target and analytical parameters summary information for waste zone samples and underburden cores.....	23
4.	Underburden core sample location information.....	29
5.	Proposed approach to sampling cores	32
6.	Sampling waste stream disposition path summary.....	46

ACRONYMS

AK	acceptable knowledge
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	<i>Code of Federal Regulations</i>
COC	chain of custody
D&D&D	deactivation, decontamination, and decommissioning
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
DQO	data quality objective
EDTA	ethylenediaminetetraacetic acid
EPA	U.S. Environmental Protection Agency
ER	environmental restoration
ESD	explanation of significant differences
FFA/CO	Federal Facility Agreement and Consent Order
FSP	field sampling plan
IAG	interface agreement
ID	identification
INEEL	Idaho National Engineering and Environmental Laboratory
MCP	management control procedure
MTRU	mixed transuranic waste
NPL	National Priorities List
OU	operable unit
PCB	polychlorinated biphenyl
PGS	Packaging Glovebox System
PPE	personal protective equipment
QA	quality assurance
QA/QC	quality assurance and quality control

QAPjP	quality assurance project plan
QC	quality control
RCRA	Resource Conservation and Recovery Act
RCS	Retrieval Confinement Structure
RFP	Rocky Flats Plant
ROD	record of decision
RWMC	Radioactive Waste Management Complex
SAP	sampling and analysis plan
SDA	Subsurface Disposal Area
SVOC	semivolatile organic compound
TBD	to be determined
TPR	technical procedure
TRU	transuranic
TSCA	Toxic Substances Control Act
UCL ₉₀	upper 90% confidence level
VOC	volatile organic compound
WAC	waste acceptance criteria
WAG	waste area group
WAP	waste analysis plan
WIPP	Waste Isolation Pilot Plant

Field Sampling Plan for the OU 7-10 Glovebox Excavator Method Project

1. INTRODUCTION AND SITE BACKGROUND

This field sampling plan (FSP) describes the collection and analysis of samples used for characterization activities in support of the Operable Unit (OU) 7-10 Glovebox Excavator Method Project within the Subsurface Disposal Area (SDA) of the Radioactive Waste Management Complex (RWMC) at the Idaho National Engineering and Environmental Laboratory (INEEL).

Between 1967 and 1969, the OU 7-10 site (which comprises Pit 9) was used for disposal of radioactively contaminated waste at the SDA. The RWMC is a facility located in the southeast portion of the INEEL. Waste Area Group (WAG) 7 is the designation for the RWMC recognized under the Federal Facilities Agreement and Consent Order (FFA/CO) (DOE-ID 1991) and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (42 USC § 9601 et seq.).

1.1 Objectives of the Project

The *Record of Decision: Declaration of Pit 9 at the Radioactive Waste Management Complex Subsurface Disposal Area at the Idaho National Engineering Laboratory, Idaho Falls, Idaho* (DOE-ID 1993) specifies retrieval of transuranic (TRU) waste from OU 7-10 (Pit 9). On October 1, 2001, the INEEL published the *Waste Area Group 7 Analysis of OU 7-10 Stage II Modifications* (INEEL 2001), which identified a feasible approach for retrieving waste from OU 7-10. The project was established to accomplish the objectives presented in that report. The overall objectives for the project are as follows:

1. Demonstrate waste zone material retrieval
2. Provide information on contaminants present in the underburden
3. Characterize waste zone material for safe and compliant storage
4. Package and store waste onsite, pending final disposition.

The project facilities and processes are being designed to safely conduct a waste zone material retrieval demonstration in a selected area of OU 7-10. The volume retrieved is expected to be between 75 and 125 yd³. The project processes consist of excavation and retrieval; sampling, packaging, and provisional storage; shutdown; deactivation, decontamination, and decommissioning (D&D&D); and environmental monitoring. Project facilities include a Weather Enclosure Structure, Retrieval Confinement Structure (RCS), excavator, ventilation system, and other supporting equipment. The packaged waste zone material retrieved by the project will be transferred to an onsite facility for temporary storage pending final disposition.

1.2 Scope of the Field Sampling Plan

The work described in this FSP will be used to:

1. Characterize retrieved waste zone materials for safe and compliant storage in accordance with agreed project objectives
2. Characterize underburden soil contaminants to support subsurface migration evaluations.

This FSP and the *Quality Assurance Project Plan for WAGs 1, 2, 3, 4, 5, 6, 7, and 10 and Inactive Sites (QAPjP)* (DOE-ID 2002) together are considered the sampling and analysis plan for the project. This FSP has been prepared in accordance with INEEL Management Control Procedure (MCP) -241, "Preparation of Characterization Plans." This FSP describes the field activities that are part of the investigation, and the QAPjP describes the processes and programs that ensure the generated data will be suitable for the intended use.

Third-party groups (i.e., regulatory agencies) may request collection of samples, some of which may not be specifically described in this plan. If acceptable to the project, the samples would be processed using protocol consistent with this plan. Sample transportation would be the responsibility of the third party. In addition, once the samples are turned over, ownership, handling, and disposition of these materials are the responsibility of the receiving party in accordance with binding legal agreements that will be established outside of this plan. In instances when third-party samples are collected, additional collocated samples will be taken for WAG 7 and may be archived pending analyses.

1.3 Site Background

The INEEL is a U.S. Department of Energy (DOE) facility, located 52 km (32 mi) west of Idaho Falls, Idaho, which occupies 2,305 km² (890 mi²) of the northeastern portion of the Eastern Idaho Snake River Plain. The RWMC is located in the southwestern portion of the INEEL, as shown in Figure 1. The SDA is a 39-ha (97-acre) area located in the RWMC. Waste Area Group 7 is the designation recognized by CERCLA (42 USC § 9601 et seq.) and in the FFA/CO (DOE-ID 1991) for the RWMC, which comprises the SDA buried waste site. Waste Area Group 7 has been subdivided into 13^a OUs. Operable Unit 7-10, which comprises Pit 9, is located in the northeast corner of the SDA. The OU 7-10 site is an area into which chemicals, radioactive materials, and sludge from DOE weapons plants and other government programs were disposed. While such disposal at the RWMC began in 1952, OU 7-10 was used and filled in the late 1960s. This project involves a designated portion of OU 7-10, as illustrated in Figure 2.

The project location is in the southwest end of the OU 7-10 area. It is defined by a fan-shaped area with a 6-m (20-ft) radius and the angular extent of 145 degrees. Figure 3 presents the plot plan of the OU 7-10 area showing infrastructure and the project location. Operable Unit 7-10 itself measures approximately 115.5 × 38.7 m (379 × 127 ft).

1.3.1 Site History

The RWMC was established in the early 1950s as a disposal site for the permanent landfill disposal of radioactive waste. Radioactive waste has been buried at the SDA in underground pits, trenches, unlined soil vaults, and one aboveground pad (Pad A). Disposal of TRU waste occurred in the SDA from 1952 to 1970, the primary source of which was from the production of plutonium components for nuclear weapons at Rocky Flats Plant (RFP).^b Waste from RFP was placed in OU 7-10 from November 1967 to June 1969. Since 1970, TRU waste has been placed on asphalt pads in interim storage at the Transuranic Storage Area. Acceptance of TRU waste from off-Site generators was discontinued in 1988.

a. Operable Units 13 and 14 were combined into the comprehensive remedial investigation and feasibility study in 1995 (Huntley and Burns 1995).

b. The Rocky Flats Plant is located 26 km (16 mi) northwest of Denver. In the mid-1990s, it was renamed the Rocky Flats Environmental Technology Site. In the late 1990s, it was again renamed, to its present name, the Rocky Flats Plant Closure Project.

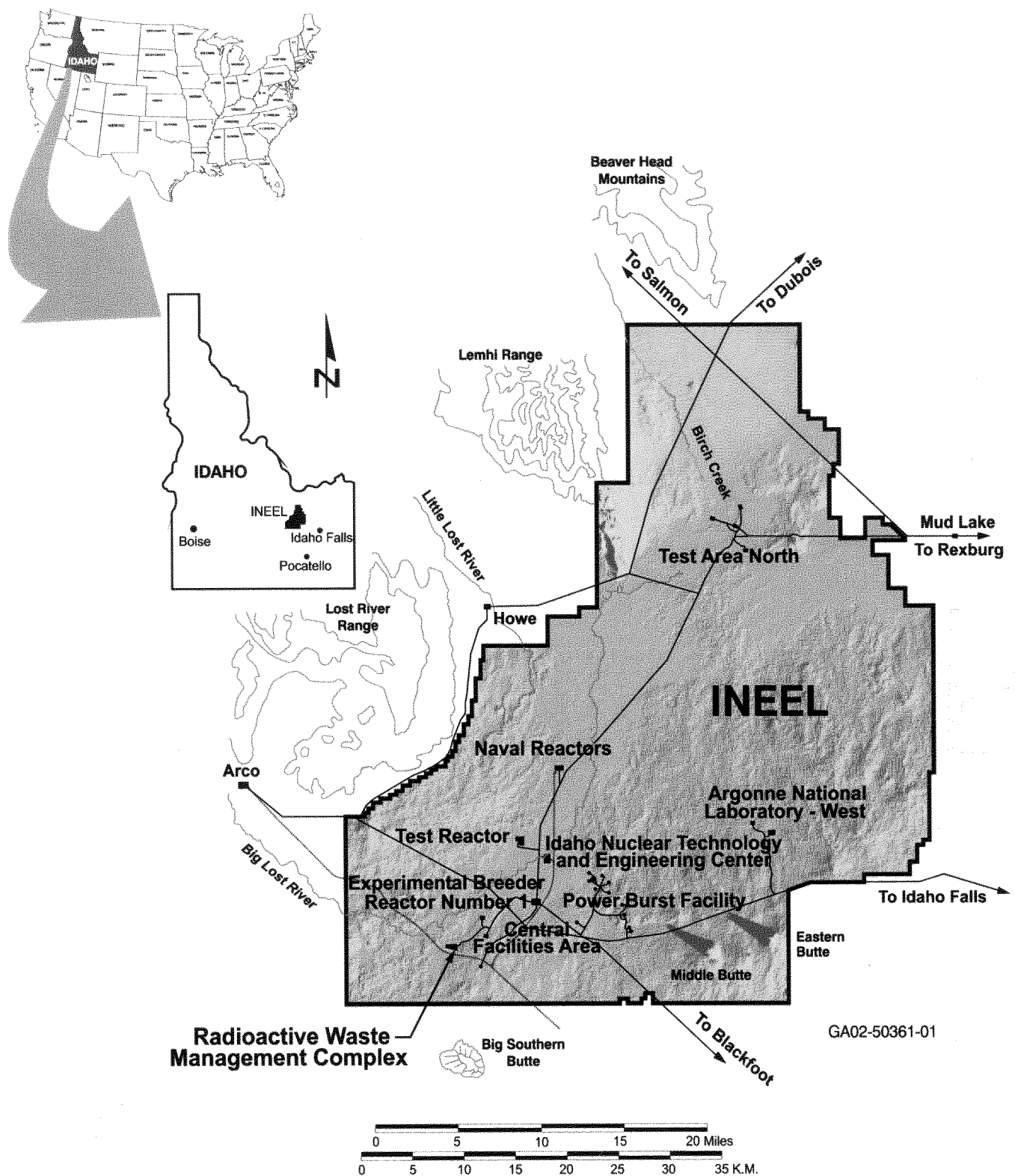


Figure 1. Location of the Radioactive Waste Management Complex within the Idaho National Engineering and Environmental Laboratory.

Detailed history of the disposal operations at the RWMC may be found in *A History of the Radioactive Waste Management Complex at the Idaho National Engineering Laboratory* (EG&G 1985). No waste disposal has occurred at OU 7-10 since its closure in 1969.

In August 1987, DOE and the U.S. Environmental Protection Agency (EPA) entered into a Consent Order and Compliance Agreement (DOE-ID 1987) in accordance with the Resource Conservation and Recovery Act (RCRA) Section 3008(h) (42 USC § 6901 et seq.). The Consent Order and Compliance Agreement required DOE to conduct an initial assessment and screening of all solid waste and hazardous waste disposal units at the INEEL and set up a process for conducting any necessary corrective actions. On July 14, 1989, the INEEL was proposed for listing on the National Priorities List (NPL) (54 FR 29820). The listing was proposed by the EPA under the authorities granted EPA by CERCLA, as amended by the Superfund Amendments and Reauthorization Act of 1986 (Public Law 99-499). The final rule that listed the INEEL on the NPL was published on November 21, 1989, in 54 FR 48184, "National Priorities List of Uncontrolled Hazardous Waste Sites; Final Rule." As a result of the listing of INEEL on the NPL, the DOE, EPA, and the Idaho Department of Environmental Quality entered into the FFA/CO on December 9, 1991. Operable Unit 7-10 was identified for an interim action under the FFA/CO as described in the *Record of Decision: Declaration for Pit 9 at the Radioactive Waste Management Complex Subsurface Disposal Area at the Idaho National Engineering Laboratory, Idaho Falls, Idaho* (DOE-ID 1993).

Several changes to the original OU 7-10 Record of Decision (ROD) (DOE-ID 1993) were documented through Explanations of Significance Difference (ESDs) to the OU 7-10 ROD documents issued in 1995 and 1998 (DOE-ID 1995, 1998). The first ESD adjusted the estimated cost of the project (DOE-ID 1995). The second ESD gave the framework for the current staged approach to remediation of OU 7-10 (DOE-ID 1998). The current approach, the OU 7-10 Glovebox Excavator Method Project, is detailed in the *Waste Area Group 7 Analysis of OU 7-10 Stage II Modifications* (INEEL 2001).

1.3.2 Existing Information and Contaminants of Interest

Inventories of waste in OU 7-10 and the SDA pits and trenches have been generated using existing and available historical records. The inventories contain uncertainties about various items including exact locations of waste inside the pit, extent of contaminant migration, specific isotopic information and chemical form, and valence state of the contaminants.

Approximately 3,115 m³ (110,000 ft³) of the estimated 4,250 m³ (150,000 ft³) of the waste in OU 7-10 was generated at the RFP. Other materials in OU 7-10 include low-level waste (LLW) from generators located at the INEEL. The waste in OU 7-10 was produced from RFP weapons production operations and INEEL nuclear reactor testing activities and includes a variety of radionuclides, organic, and inorganic compounds. The OU 7-10 ROD contains an inventory of these materials (DOE-ID 1993). In addition to waste, the pit contains an estimated 7,100 m³ (250,000 ft³) of overburden soil and approximately 9,900 m³ (350,000 ft³) of interstitial and underburden soil.

The depth of the pit from ground surface to the bedrock is approximately 6 m (20 ft). The soil cover or overburden has been estimated to be 1.2 to 1.8 m (4 to 6 ft) thick.

The OU 7-10 ROD inventory was compiled from two documents: (1) *Nonradionuclide Inventory in Pit 9 at the RWMC* (Liekhus 1992), which was converted from an earlier report, *Nonradionuclide Inventory in Pit 9 at the RWMC* (Liekhus 1991), and (2) *Methodology for Determination of a Radiological Inventory for Pit 9 and Corresponding Results* (King 1991). Since the OU 7-10 ROD was written, a number of refinements to the inventory estimates have been made based on various new information sources. The current OU 7-10 inventory document is *Pit 9 Estimated Inventory of*

Radiological and Nonradiological Constituents (Einerson and Thomas 1999), which estimates the inventory for the entire disposal pit from all generators. However, this inventory does not focus on the Stage I and II area in the southern portion of OU 7-10 where this project is being conducted. Stage I and II refers to a portion of the framework for a staged approach to remediation of OU 7-10, as described in *Explanation of Significant Differences for the Pit 9 Interim Action Record of Decision at the Radioactive Waste Management Complex at the Idaho National Engineering and Environmental Laboratory* (DOE-ID 1998).

Inventory information pertinent to the Stage I and II areas is summarized in Table 1. As previously stated, this inventory is the best available information based on incomplete historical records. The OU 7-10 Stage I and II area contains waste streams from the RFP. It has been determined that waste from various INEEL facilities was disposed of elsewhere in OU 7-10. The waste in the Stage I and II area of OU 7-10 was shipped from the RFP in 55-gal drums (Clements 1982). The drum quantity estimates shown on Table 1 are for the entire 12 × 12-m (40 × 40-ft) Stage I and II area^c and for the project retrieval area (INEEL 2002a). The project retrieval area includes only a portion of the overall 12 × 12-m (40 × 40-ft) Stage I and II retrieval area. Figure 3 depicts the proposed excavation and retrieval area.

As the summary on Table 1 shows, the RFP waste forms contain various radiological and nonradiological contaminants. The material shipped to OU 7-10 from RFP included weapons-grade plutonium and uranium isotopes. Weapons-grade plutonium (i.e., Pu-52) contains Pu-238, Pu-239, Pu-240, Pu-241, and Pu-242. Uranium isotopes shipped to the RWMC included U-235 and U-238. Also included in the waste shipments were Am-241 and Np-237, which are daughter products resulting from the radioactive decay of Pu-241. In addition to the Am-241 produced by the decay of the inventory, Am-241 removed from Pu-52 during processing at the RFP also was disposed of in OU 7-10. This extra Am-241 is a significant contributor to the total radioactivity located in OU 7-10. A number of radionuclides primarily from INEEL waste generators (e.g., Co-60, Cs-137, Sr-90, Y-90, and Ba-137) are not expected to be encountered in the project area.

The primary organic chemicals known to be in OU 7-10 include carbon tetrachloride, trichloroethene, 1,1,1-trichloroethane, tetrachloroethene, lubricating oils, Freon 113, alcohols, organic acids, and versenes (ethylenediaminetetraacetic acid [EDTA]). Examples of inorganic chemicals known to be in the waste include hydrated iron, zirconium, beryllium, lead, sodium nitrate, potassium nitrate, cadmium, dichromates, potassium phosphate, potassium sulfate, silver, asbestos, and calcium silicate. A few nonradiological constituents have been reported as having been disposed of somewhere in the SDA and may be in OU 7-10. However, it is not known if these constituents were disposed of in OU 7-10 and verification is not possible. They include sodium and potassium cyanide, lithium oxide, mercury, nitrobenzene, picric acid, and polychlorinated biphenyls (PCBs). Waste management activities will be based on information from the various inventory documents identified in the preceding paragraphs. In addition, analytical data collected during project activities will be used to determine appropriate waste management.

c. R. W. Thomas Interdepartmental Memorandum to D. E. Wilkins, April 16, 1999, "Waste Contents Associated with OU 7-10 Stages I and II Activities in Pit 9," RWT-01-99, Idaho National Engineering and Environmental Laboratory, Bechtel BWXT Idaho, LLC, Idaho Falls, Idaho.

Table 1. Waste content in the OU 7-10 Stage I and II and project retrieval areas.

Waste Stream	Summary Characteristics	Packaging	Estimated Quantity, Stage I and II, 40 × 40 ft	Estimated Quantity, OU 7-10 Glovebox Excavator Method Retrieval Area
Series 741 sludge first stage sludge	Salt precipitate containing plutonium and americium oxides, depleted uranium, metal oxides, and organic constituents.	18.1 to 22.7 kg (40 to 50 lb) of Portland cement added to bottom of drum and each of two (inner and outer plastic bags, and the top of the outer bags to absorb any free liquids. Lead sheeting may line inside of the drum as well	3 drums	1 drum
Series 742 sludge second stage sludge	Salt precipitate containing plutonium and americium oxides, metal oxides, and organic constituents.	18.1 to 22.7 kg (40 to 50 lb) of Portland cement added in layers to absorb any free liquids. Waste is double-bagged and drummed.	27 drums	1 drum
Series 743 sludge organic setups	Organic liquid waste solidified using calcium silicate (paste or grease-like).	113.6 L (30 gal) of organic waste mixed with 45.4 kg (100 lb) calcium silicate. Small quantities (4.5 to 9.1 kg [10 to 20 lb]) of Oil-Dri added to top and bottom of drum, if necessary. Double-bagged.	379 drums	50 to 80 drums
Series 744 sludge special setups	Complexing chemicals (liquids) including versenes, organic acids and alcohols solidified with cement.	86.2 kg (190 lb) of Portland cement and 22.7 kg (50 lb) of magnesia cement in drum followed by the addition of 99.9 L (26.4 gal) of liquid waste. Additional cement top and bottom. Double-bagged.	2 drums	1 drum
Series 745 sludge evaporator salts	Salt residue from evaporated liquids from solar ponds containing 60% sodium nitrate, 30% potassium nitrate, and 10% miscellaneous.	Salt residue packaged in plastic bag and drum. Cement added to damp or wet salt, when necessary.	42 drums	8 drums
Noncombustible waste	Various miscellaneous waste such as gloveboxes, lathes, ducting, piping, angle iron, electronic instrumentation, pumps, motors, power tools, hand tools, chairs, and desks.	Varies by process line generating the waste. Waste may have been wrapped in plastic and placed directly into the waste container.	28 drums	5 drums
Combustible waste	Dry combustible materials such as paper, rags, plastics, surgeons' gloves, cloth coveralls and booties, cardboard, wood, wood filter frames, and polyethylene bottles.	Varies by process line generating the waste. Plastic bags used in some instances, but in other instances waste placed directly into waste container.	260 drums	40–60 drums
Graphite	Graphite mold pieces after excess plutonium removal. Molds are broken into large pieces before packaging.	Drums lined with polyethylene bags and, most likely, a cardboard liner.	22 drums	5 drums
Empty 55-gal drums	Empty drums that originally held lathe coolant at the Rocky Flats Plant. Some drums may contain residues.	Single drum placed in cardboard carton.	544 drums	80–120 drums

The TRU radionuclides in OU 7-10 are believed to be primarily contained in the drummed sludge and other RFP waste (e.g., graphite). The buried waste contains TRU radionuclides and low-level waste. For purposes of clarification, the following definitions are provided below:

- **Transuranic radionuclides**—Alpha-emitting radionuclides with an atomic number higher than 92 (DOE Order 435.1).
- **Transuranic waste**—Without regard to source or form, waste that is contaminated with alpha-emitting, TRU radionuclides (atomic number greater than 92) with half-lives greater than 20 years and concentrations greater than 100 nCi/g at the time of assay. Heads of Operations Offices (e.g., DOE-ID) may determine if other alpha-contaminated waste, peculiar to a specific site, must be managed as TRU waste (DOE Order 435.1). At the INEEL, waste containing Ra-226 and U-233 is included as TRU waste in the *Idaho National Engineering and Environmental Laboratory Waste Acceptance Criteria* (Revision 14) (DOE-ID 2002).
- **Low-level waste**—Waste that is not high-level radioactive waste, spent nuclear fuel, TRU waste, by-product material (as defined in Section 11e[2] of the Atomic Energy Act of 1954, as amended), or naturally occurring radioactive material (DOE Order 435.1).

1.4 Report Organization

After the site history given in this section, Section 2 presents the sampling objectives and data quality objectives (DQOs). Section 3 describes the sample locations and frequency. Section 4 provides information about sample designation and associated requirements. Section 5 contains a description of sampling equipment and procedures. Section 6 describes sample handling and analysis including sample labeling and custody requirements. Section 7 discusses management of waste generated from the sampling activities. Section 8 contains the cited references.